This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims

1. (Currently amended) An apparatus for automated loading and unloading of substrates in a vacuum environment, the apparatus comprising:

a vacuum vessel in [[a]]the form of an enclosure bounding a loading and unloading chamber and defining a transfer port in communication with[[,]] the ~~loading and unloading~~ chamber and with an evacuated region outside the vacuum vessel;

~~comprising~~

[[a)]]—a substrate holder in the chamber, the substrate holder comprising

———a substrate support table for supporting a substrate, and

———locating means co-operable with the substrate support table for causing a substrate which is supported thereon to be pressed against and thereby located on the substrate support table;~~b) a transfer port in communication with an evacuated region outside the vacuum vessel,~~ and

[[c)]]—release means in the chamber, the release means being adapted for withholding said co-operation of the locating means with the substrate support table and providing a temporary support of the substrate clear of the substrate support table so as to permit movement of the substrates to and from the substrate holder;~~wherein the loading and unloading chamber is adapted for receiving and outputting the substrate holder;~~

wherein the loading and unloading chamber is hermetically sealed apart from the transfer port to allow for a[[the]] vacuum environment to prevail in the loading and unloading chamber; and

wherein the transfer port allows ~~for transferring~~transfer of the substrate holder between the ~~vacuum environment of the loading and unloading~~ chamber and the evacuated region outside the vacuum vessel.

2. (Previously presented) The apparatus as claimed in claim 1, wherein the locating means defines a reference plane for a top face of the supported substrate.

3. (Previously presented) The apparatus as claimed in claim 2, wherein the reference plane is defined by three spaced-apart contact points for contacting the substrate top face.

4. (Previously presented) The apparatus as claimed in claim 3, wherein the contact points are provided by contact surfaces of stop members disposed above the substrate support table and fixed relative to a body member of the substrate holder.

5. (Previously presented) The apparatus as claimed in claim 1, wherein the locating means comprises resilient means to cause a supported substrate to be biased towards the substrate support table.

6. (Previously presented) The apparatus as claimed in claim 5, wherein the resilient means comprises a resilient mounting of the substrate support table.

7. (Previously presented) The apparatus as claimed in claim 6, wherein the resilient mounting comprises at least one compression spring.

8. (Previously presented) The apparatus as claimed in claim 7, wherein the resilient means comprises at least one leaf spring arranged to provide an anti-twist mounting of the substrate support table.

9. (Previously presented) The apparatus as claimed in claim 5, wherein the release means comprises displacing means to displace the substrate support table against the direction of bias by the resilient means.

10. (Previously presented) The apparatus as claimed in claim 9, wherein the displacing means comprises at least one displacing member movable to engage and depress the substrate support table.

11. (Previously presented) The apparatus as claimed in claim 10, comprising resilient restoring means to oppose movement of the at least one displacement member to engage and depress the substrate support table.

12. (Previously presented) The apparatus as claimed in claim 11, wherein the at least one displacing member comprises a pusher carried by an upwardly and downwardly movable carrier member, and wherein the displacing means further comprises drive means to cause downward movement of the carrier member.

13. (Previously presented) The apparatus as claimed in claim 12, wherein the drive means comprises lever means drivably engaging the carrier member and actuating means to pivot the lever means.

14. (Previously presented) The apparatus as claimed in claim 13, wherein the lever means comprises at least one rocker drivably engaging the carrier member by way of a roller.

15. (Previously presented) The apparatus as claimed in claim 13, wherein the actuating means is disposed outside the vacuum vessel and coupled to the lever means by way of coupling means passing through a vacuum-tight entry passage of the vessel.

16. (Previously presented) The apparatus as claimed in claim 15, wherein the actuating means is disposed below the vacuum vessel.

17. (Previously presented) The apparatus as claimed in claim 13, wherein the actuating means comprises a pneumatic piston-cylinder unit.

18. (Previously presented) The apparatus as claimed in claim 1, wherein the release means comprises temporary support means movable upwardly through passage means in the substrate support table to provide the temporary substrate support.

19. (Previously presented) The apparatus as claimed in claim 18, wherein the temporary support means comprises at least three spaced-apart axially movable support pins defining a plane of temporary support by their upper ends.

20. (Previously presented) The apparatus as claimed in claim 19, wherein the passage means comprises an individual passage in the substrate support table for each support pin.

21. (Previously presented) The apparatus as claimed in claim 18, wherein the temporary support means is movable downwardly to a position clear of the substrate holder.

22. (Previously presented) The apparatus as claimed in claim 18, wherein the release means comprises drive means to move the temporary support means upwardly and downwardly between a position providing the temporary substrate support and a position permitting removal of the substrate holder from the loading and unloading chamber.

23. (Previously presented) The apparatus as claimed in claim 22, wherein the drive means is disposed outside the vacuum vessel and coupled to the temporary support means by way of coupling means passing through a vacuum-tight annexure of the vessel.

24. (Previously presented) The apparatus as claimed in claim 23, wherein the drive means is disposed below the vessel.

25. (Previously presented) The apparatus as claimed in claim 22, wherein the drive means comprises a linear stepping drive.

26. (Previously presented) The apparatus as claimed in claim 18, wherein the temporary support means is rotationally movable to angularly adjust the position of the temporarily supported substrate relative to the substrate support table.

27. (Previously presented) The apparatus as claimed in claim 26, comprising an adjusting drive drivingly connected to the temporary support means by drive transmission means providing rotary movement of the temporary support means, but accommodating the upward movement of the temporary support means.

28. (Previously presented) The apparatus as claimed in claim 27, wherein the drive transmission means comprises a rotary member rotatable by the adjusting drive and connected to the temporary support means by a plurality of spaced-apart coupling pins so coupled to a component fixed to the temporary support means as to be secure against relative rotation, but axially displaceable relative to the component.

29. (Previously presented) The apparatus as claimed in claim 28, wherein the rotary member is rotatably mounted in a wall of the vessel.

30. (Previously presented) The apparatus as claimed in claim 27, wherein the adjusting drive is disposed outside the vacuum vessel and coupled to the rotary member by coupling means passing through a vacuum-tight entry passage of the vessel.

31. (Previously presented) The apparatus as claimed in claim 30, wherein the coupling means comprises a shaft incorporating a flexible portion permitting flexure of the shaft.

32. (Previously presented) The apparatus as claimed in claim 30, wherein the adjusting drive is disposed laterally of the vessel.

33. (Previously presented) The apparatus as claimed in claim 27 wherein the adjusting drive comprises a linear actuator.

34. (Previously presented) The apparatus as claimed in claim 27, wherein the adjusting drive is operable to provide stepless angular adjustment within a range up to substantially half a degree.

35. (Currently Amended) The apparatus as claimed in 26, comprising an optical system to determine [[the]]an angular position of the temporarily supported substrate.

36. (Previously presented) The apparatus as claimed in claim 35, wherein the optical system comprises image generating means for causing generation of an image of part of the substrate, image detecting means for detecting the image and determining means for comparing the detected image with a reference image and determining therefrom the angular position of the substrate relative to a target position.

37. (Previously presented) The apparatus as claimed in claim 36, wherein the image generating means comprises a light source and optical transmission means for transmitting light from the source to produce a topographical image of at least part of a top face of the substrate.

38. (Previously presented) The apparatus as claimed in claim 36, wherein the image detecting means comprises a microscope for detecting the image and a camera for recording the detected image.

39. (Previously presented) The apparatus as claimed in claim 36, wherein the determining means comprises data processing means for software processing of data indicative of the orientation of the detected image and comparison thereof with data indicative of the orientation of the reference image.

40. (Previously presented) The apparatus as claimed in claim 35, wherein the optical system is disposed above the vacuum vessel.

41. (Previously presented) The apparatus as claimed in claim 26, comprising control means to control rotational movement of the temporary support means in dependence on the substrate angular position determined by the optical system.

42. (Previously presented) The apparatus as claimed in claim 26, wherein the temporary support means is additionally movable upwardly and downwardly to bring the top face of the temporarily supported substrate into a focal plane of the optical system.

43. (Previously presented) The apparatus as claimed in claim 1, wherein the transfer port is disposed to enable lateral transfer of the substrate holder between the evacuated region and the loading and unloading chamber.

44. (Previously presented) The apparatus as claimed in claim 1, wherein the vacuum vessel is substantially box-shaped and the apparatus includes housings arranged above and below the vacuum vessel and accommodating functional components of the apparatus.

45. (Previously presented) The apparatus as claimed in claim 1, the apparatus being constructed as a module attachable to a substrate processing machine with a chamber defining the evacuated region.

46. (Currently amended) A substrate processing machine having an evacuated region and ~~incorporating~~ a substrate processing station within the evacuated region, the machine comprising an adjustable~~:~~

~~a substrate~~ loading and unloading apparatus comprising:

a vacuum vessel in [[a]]the form of an enclosure bounding a loading and unloading chamber and defining a transfer port in communication with[[,]] the ~~loading and unloading~~ chamber and, outside the vacuum vessel, with the evacuated region;~~comprising~~

a substrate holder within the chamber, ~~which comprises~~comprising a substrate support table for supporting a substrate and locating means co-operable with the substrate support table ~~to cause~~ for causing a substrate which is supported thereon to be pressed against and thereby located on the substrate support base~~table;,~~

~~a transfer port in communication with an evacuated region outside the vacuum vessel;~~ and

release means within the chamber, the release means being adapted for withholding said co-operation of the locating means with the substrate support table and

providing a temporary support of the substrate clear of the substrate support table so as to ~~allow for~~permit movement of substrates to and from the substrate holder,

~~wherein the loading and unloading chamber is adapted for receiving and outputting the substrate holder;~~

wherein the loading and unloading chamber is hermetically sealed apart from the transfer port to allow for a[[the]] vacuum environment to prevail in the loading and unloading chamber; and

wherein the transfer port allows ~~for transferring~~transfer of the substrate holder between the ~~vacuum environment of the loading and unloading~~ chamber and the evacuated region outside the vacuum vessel.

47. (Previously presented) The machine as claimed in claim 46, wherein the evacuated region further incorporates a transfer station for transfer of the substrate holder between the processing station and the loading and unloading chamber by way of the transfer port.

48. (Previously presented) The machine as claimed in claim 46, wherein the machine includes substrate feed means for feeding substrates into and removing substrates from the evacuated region.

49. (Previously presented) The machine as claimed in claim 48, wherein the feed means comprises an air lock to preserve a vacuum environment of the evacuated region during feed of substrates.

50. (Previously presented) The machine as claimed in claim 47, comprising remotely actuable transfer means for effecting the substrate holder transfer.

51. (Previously presented) The machine as claimed in claim 47, wherein the transfer station additionally serves for transfer of substrates to and from the substrate holder by way of the transfer port when the substrate holder is in the loading and unloading chamber.

52. (Previously presented) The machine as claimed in claim 51, comprising remotely actuable transfer means for effecting the substrate transfer.

53. (Previously presented) The machine as claimed in claim 46, the machine being an electron beam pattern-writing machine for writing patterns on substrates in succession in the processing station.